



# MILL MATTERS

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## MAKE PROCESSING A PRIORITY



Forage quality can make or break cows' milk production potential. When it comes to corn silage, proper chop length and optimal kernel processing are essential.

In a nutshell, kernel processing breaks up corn kernels to improve starch digestibility and utilization in the cow. And, the kernel processing score (KPS) plays a fundamental role in determining how the corn silage will feed throughout the year. Meanwhile, where you set the theoretical length of cut (TLC) impacts the particle length needed for proper rumination.

As you plan for this year's harvest, it is important to work through a checklist to ensure you achieve your goals for well-processed corn silage, noted Kory Durst, Chr Hansen, in an article for Progressive Dairyman.

Several weeks prior to harvest, give your chopping equipment a thorough check-up:

- Start at the front of the machine and follow the crop flow. At the chopper head, make sure the knives are in good condition and sharp enough to make it through the season. Nicked knives should be replaced to prevent uneven chop lengths.
- Make certain that the scrapers, crop guides and rolls are in good working condition and are correctly adjusted or replaced if worn.
- Ensure the shear bar is square.
- At the cutter head, inspect knives daily for damage from rocks. Daily sharpening to use minimal horsepower is also warranted.
- The kernel processor does most of the work processing the grain, so look for signs of rock damage. Replace the rolls if they show signs of excess wear.
- Measure the gap setting between the rolls to make sure it is even and accurate. It should be between 1 and 3 mm to ensure it cracks all the kernels. Next, set the cut length at 0.75 inch, which is longer than the typical 0.37 to 0.5 inch settings for non-processed corn silage.
- If roller mill adjustments are not producing expected kernel pro-

cessing results, inspect the differential speed of the roller. The upper roller should run faster than the lower roller. Differences of 10 to 15 percent are common.

Inspect, adjust and replace parts, if warranted. Consult with your forage equipment specialist for additional points of inspection and specific recommendations prior to and during harvest.

For today's high-producing dairy cows to optimally digest the corn grain in whole-plant corn silage, the corn kernels must be optimally processed.

A research review conducted at the University of Wisconsin showed that total tract starch digestion increased by 5.9 percent when kernel processing rolls were set at one to three millimeters, compared with no processing.

A number of studies also report relationships between the processing score and fecal starch content. As the processing score worsens, fecal starch increases. A reduction in fecal starch results in improved efficiency of starch utilization from the TMR. Research from Jim Ferguson at the University of Pennsylvania indicates that a one unit change in fecal starch equates to 0.72 pound of milk.

If improved kernel processing reduces fecal starch from 5 percent to 1.5 percent, there is energetic potential for an additional 2.5 pounds of milk from the same corn silage.

Dave Mertens, formerly with the U.S. Dairy Forage Research Center, developed the lab method to evaluate corn silage kernel processing. Basically, a corn silage sample is dried and shaken or tapped through a series of nine screens.

The portion of the sample that passes through a 4.75-mm screen is collected and analyzed for starch as a percentage of the total starch in the corn silage sample. The resulting percentage is the kernel processing score (KPS). To put 4.75 mm in other terms, approximately 1/12th of a kernel will pass through the screen, and that is about the same diameter as a 3/16-inch drill bit.

Corn Silage Kernel Processing Score Guidelines	
Optimum	>70 percent
Adequate	50 to 70 percent
Inadequate	<50 percent

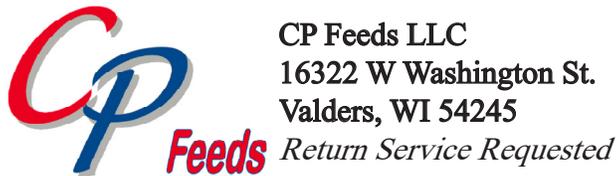
In order to minimize fecal starch and maximize energetic efficiency, corn silage KPS should be above 70 percent. Randy Shaver at the University of Wisconsin estimates about two pounds more milk are produced from optimally processed versus adequately processed corn silage. He also estimates about a two pound loss in milk when corn silage is inadequately processed compared with adequately processed corn silage.

“The challenge with the processing score is that it is a value determined after the corn silage is harvested,” notes Larry Chase, formerly with Cornell University. What can you do to estimate the degree of kernel processing as the crop is being harvested?

A few options exist at the field level. These include:

- Filling a 32 ounce cup with corn silage and looking at the corn kernels (Pioneer method). If two or less whole or half kernels are observed, this is considered ideal.
- Put fresh corn silage in a bucket of water and agitate it slightly. The kernels will sink to the bottom. Pour off the water and visually inspect the kernels. Researchers at the University of Wisconsin suggest that properly processed corn silage should have almost no cracked or whole kernels.
- Use the Penn State box and look at the kernels in the pan. The same guidelines for the water separation procedure above can be used to determine the results.

These approaches can be used during harvest to determine if roller settings need to be changed. You may need to make adjustments a number of times during the harvest process due to changes in dry matter, maturity and fields. By monitoring during harvest, you can improve the CSPA of the silage, increase starch utilization and increase milk production.



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## Don't let your inoculant fail you now!

We're in the forage harvest home stretch for 2018. Get the most out of your inoculant investment.

- 1. Keep inoculants cool.** Inoculants should be refrigerated or frozen to keep the bacteria inside the canister alive. If you do freeze them, avoid repeated freeze-thaw cycles, as they can kill the bugs.
- 2. Take care when transporting.** Inoculants should be kept out of direct sunlight and heat. Don't put them on the dashboard, in a pickup truck bed or leave them in a hot vehicle.
- 3. Cool water is your friend.** Warm or hot water will kill bugs. Feel the water before adding it to the applicator to make sure it is cool. If you fill the tank with a hose, let it run for a bit so that the water is cool.
- 4. Keep it moving.** Calibrate the applicator and check the water level in the tank while chopping. If the water level isn't changing, find the problem and fix it.
- 5. Keep it under 90.** Monitor the temperature to ensure that the solution is staying cool in the tank. If it heats to temperatures above 90 degrees, cool it down. Placing a frozen soda bottle in the mixture is an easy way to accomplish this. Don't add ice directly to the mixture because this will dilute the inoculant.